

CLAIMS

What is claimed is:

1. A geo-textile sheet infused with a polymeric flocculant.
2. A geo-textile assembly comprising:
 - two opposing geo-textile sheets, the two geo-textile sheets defining at least one cavity; and
 - a polymeric flocculant material, the polymeric flocculant material disposed within the at least one cavity.
3. A geo-fabric assembly comprising:
 - a first geo-fabric sheet, the first geo-fabric sheet adapted to filter entrained non-colloidal particles from a flow of water;
 - a second geo-fabric sheet, the second geo-fabric sheet adapted to filter entrained non-colloidal particles from a flow of water; the second geo-fabric sheet fixedly disposed adjacent to the first geo-fabric sheet so as to form at least one cavity;
 - a flocculant material, the flocculant material disposed within the at least one cavity.
4. The geo-fabric assembly of Claim 3, wherein the non-colloidal particles comprise non-colloidal silt, the colloidal particles comprise colloidal silt, and wherein the flocculant material is reactive with waterborne colloidal particles so as to cause the waterborne colloidal particles to coagulate and form flocs.

5. The geo-fabric assembly of Claim 3, wherein at least one of the first and second geo-fabric sheets comprises a non-woven geo-textile.
6. The geo-fabric assembly of Claim 5, wherein the non-woven geo-textile comprises a needle-punched, non-woven geo-textile.
7. The geo-fabric assembly of Claim 3, wherein at least one of the first and second geo-fabric sheets comprises a heat-bonded geo-textile.
8. The geo-fabric assembly of Claim 3, wherein the flocculant material comprises a polymeric flocculant material.
9. The geo-fabric assembly of Claim 8, wherein the polymeric flocculant material comprises anionic polyarylmide.
10. The geo-fabric assembly of Claim 8, wherein the polymeric flocculant material comprises a hydrated polymeric flocculant material.
11. The geo-fabric assembly of Claim 1, wherein at least one of the first and second geo-fabric sheets is attachable to a support frame so as to form a filtration barrier.
12. A geo-fabric assembly comprising:
 - a geo-fabric sheet, the geo-fabric sheet adapted to filter entrained non-colloidal particles from a flow of water;
 - a flocculant material, the flocculant material disposed within the geo-fabric sheet, the flocculant material reactive with waterborne colloidal particles so as to cause waterborne colloidal particles to coagulate and form flocs.

13. The geo-fabric assembly of Claim 12, the geo-fabric sheet comprising a geotextile.

14. A method of manufacturing a geo-fabric assembly, the method comprising the steps of:

(a) providing a first geo-fabric sheet, a second geo-fabric sheet, and a polymeric flocculant material, the polymeric flocculant materials comprising dry polymeric flocculant particles;

(b) spreading the first geo-fabric sheet over a working surface;

(c) applying a layer of the dry polymeric flocculant particles upon the first geo-fabric sheet;

(d) spreading the second geo-fabric sheet over the first geo-fabric sheet and the layer of dry polymeric flocculant particles to form an un-affixed geo-fabric assembly;

(e) compressing the un-affixed geo-fabric assembly;

(f) wetting the un-affixed geo-fabric assembly so as to hydrate the polymeric flocculant material;

(g) compressing the wetted, un-affixed geo-fabric assembly so as to minimize variations in the thickness of the hydrated polymeric flocculant material over the wetted, un-affixed geo-fabric assembly; and

(h) mechanically affixing the second geo-fabric sheet to the first geo-fabric sheet.

15. The method of Claim 14, the method further comprising the step of:

affixing a woven wire backing to at least one of the first geo-fabric sheet and the second geo-fabric sheet.

16 The method of Claim 14, the step (h) further comprising sewing second geo-fabric sheet to the first geo-fabric sheet so as to form a plurality of pockets, each the pocket containing a portion of the polymeric flocculant material.

17. The method of Claim 14, wherein at least one of the first and second geo-fabric sheets comprises a non-woven geo-textile, and wherein the non-woven geo-textile comprises a non-woven geo-textile having an average fabric weight of at least 6 ounces per square yard.

18. The method of Claim 17, wherein the non-woven geo-textile has an average fabric weight of between 7 ounces per square yard and 8 ounces per square yard.

19. The method of Claim 17, wherein the non-woven geo-textile comprises a needle-punched, non-woven geo-textile.

20. The method of Claim 17, wherein the non-woven geo-textile comprises a heat-bonded geo-textile.

21. The method of Claim 14, wherein the polymeric flocculant material comprises anionic polyarylmide.

22. The method of Claim 14, wherein the layer of the dry polymeric flocculant particles has an average weight per area of covered geo-fabric of at least 0.02 pounds per square foot.

23. The method of Claim 22, wherein the layer of the dry polymeric flocculant particles has an average weight per area of covered geo-fabric of 0.04 pounds per square foot.

24. A method of manufacturing a geo-fabric assembly, the method comprising the steps of:

(a) providing: a first geo-fabric sheet, a second geo-fabric sheet, and a polymeric flocculant material, the polymeric flocculant materials comprising dry polymeric flocculant particles;

(b) spreading the first geo-fabric sheet over a working surface;

(c) applying a layer of the dry polymeric flocculant particles upon the first geo-fabric sheet;

(d) spreading the second geo-fabric sheet over the first geo-fabric sheet and the layer of dry polymeric flocculant particles to form an un-affixed geo-fabric assembly;

(e) compressing the un-affixed geo-fabric assembly;

(f) mechanically affixing the second geo-fabric sheet to the first geo-fabric sheet so as to form a plurality of pockets, each the pocket containing a portion of the polymeric flocculant material;

(g) wetting the geo-fabric assembly so as to hydrate the polymeric flocculant material; and

(h) compressing the wetted geo-fabric assembly so as to minimize variations in the thickness of the hydrated polymeric flocculant material within the pockets of the wetted geo-fabric assembly.

25. The method of Claim 24, wherein at least one of the first and second geo-fabric sheets comprises a non-woven geo-textile, and wherein the non-woven geo-textile comprises a non-woven geo-textile having an average fabric weight of at least 6 ounces per square yard.

26. The method of Claim 24, wherein the non-woven geo-textile having an average fabric weight of between 7 ounces per square yard and 8 ounces per square yard.

27. The method of Claim 24, wherein the polymeric flocculant material comprises anionic polyarylimide.

28. The method of Claim 27, wherein the layer of the dry polymeric flocculant particles has an average weight per area of covered geo-fabric of at least 0.02 pounds per square foot.

29. The method of Claim 28, wherein the layer of the dry polymeric flocculant particles has an average weight per area of covered geo-fabric of 0.04 pounds per square foot.

30. A method of manufacturing a geo-fabric assembly, the method comprising the steps of:

- (a) providing a first geo-fabric sheet, a second geo-fabric sheet, and a hydrated polymeric flocculant material comprising an emulsion of polymeric flocculant material;
- (b) spreading the first geo-fabric sheet over a working surface;
- (c) applying a layer of the hydrated polymeric flocculant material upon the first geo-fabric sheet;
- (d) spreading the second geo-fabric sheet over the first geo-fabric sheet and the layer of hydrated polymeric flocculant material to form an un-affixed geo-fabric assembly;
- (e) compressing the un-affixed geo-fabric assembly so as to minimize variations in the thickness of the hydrated polymeric flocculant material over the un-affixed geo-fabric assembly; and
- (f) mechanically affixing the second geo-fabric sheet to the first geo-fabric sheet.

31. The method of Claim 30, the step (f) further comprising sewing a second geo-fabric sheet to the first geo-fabric sheet so as to form a plurality of pockets, each of the pockets containing a portion of the polymeric flocculant material.

32. The method of Claim 30, wherein at least one of the first and second geo-fabric sheets comprises a non-woven geo-textile, and wherein the non-woven geo-textile comprises a non-woven geo-textile having an average fabric weight of at least 6 ounces per square yard.

33. The method of Claim 32, wherein the non-woven geo-textile has an average fabric weight of between 7 ounces per square yard and 8 ounces per square yard.

34. The method of Claim 30, wherein the polymeric flocculant material comprises anionic polyarylmide.

35. The method of Claim 34, wherein the layer of the dry polymeric flocculant particles has an average weight per area of covered geo-fabric of at least 0.02 pounds per square foot.

36. The method of Claim 35, wherein the layer of the dry polymeric flocculant particles has an average weight per area of covered geo-fabric of 0.04 pounds per square foot.

37. A method of filtering colloidal silt from a water flow, the method comprising the steps of:

(a) providing a filtration barrier for impeding a water flow, the filtration barrier comprising:

a support frame;

a first geo-fabric sheet, the first geo-fabric sheet having an influent filtering surface and an interior surface;

a second geo-fabric sheet, the second geo-fabric sheet adapted to filter entrained non-colloidal particles from a flow of water, the second geo-fabric sheet having a floc filtering surface and an effluent surface the second geo-fabric sheet fixedly disposed adjacent to the first geo-fabric sheet such that the interior surface and the floc filtering surface form at least one cavity; and

a flocculant material, the flocculant material disposed within the at least one cavity, the flocculant material reactive with waterborne colloidal particles so as to cause waterborne colloidal particles to coagulate and form flocs, wherein at least one of the first and second geo-fabric sheets is affixed to the support frame so as to form a filtration barrier;

(b) positioning the filtration barrier transverse to the water flow so as to form an influent stream of water flow directed through the influent surface and so as to form a corresponding effluent stream of water flow emitted from the effluent surface, the influent stream comprising colloidal silt;

(c) flowing the influent stream through the influent surface so as to form a treatment stream;

(d) flowing the treatment stream through the flocculant material so as to coagulate a portion of the colloidal silt and form flocs; and

(e) flowing the treatment stream through the floc filtering surface so as to remove at least a portion of the flocs and to form an effluent stream.

38. The method of Claim 37, wherein the first geo-fabric sheet is adapted to filter entrained non-colloidal particles from a flow of water, and wherein the influent stream further comprises non-colloidal silt, the step (c) further comprising:

flowing the influent stream through the influent surface so as to remove non-colloidal silt.

39. The method of Claim 37, wherein the water flow comprises an un-channeled water flow across a ground surface.

40. The method of Claim 37, wherein the water flow comprises a channeled water flow.

41. A geo-fabric assembly comprising:

a first geo-fabric sheet, the first geo-fabric sheet comprising a needle-punched, non-woven geo-textile adapted to filter entrained non-colloidal silt from a flow of water and having an average apparent opening size of between US Standard Sieve size number 20 and US Standard Sieve size number 40;

a second geo-fabric sheet, the second geo-fabric sheet comprising a needle-punched, non-woven geo-textile sheet adapted to filter entrained non-colloidal silt from a flow of water and having an average apparent opening size of between US Standard Sieve size number 20 and US Standard Sieve size number 40; the second geo-fabric sheet fixedly disposed adjacent to the first geo-fabric sheet so as to form at least one cavity; and

a polymeric flocculant material disposed within at least one the cavity, the polymeric flocculant material reactive with waterborne colloidal particles so as to cause waterborne colloidal particles to coagulate and form flocs,

wherein the polymeric flocculant material comprises anionic polyarylmide,

wherein at least one of the first and second geo-fabric sheets is attachable to a support frame so as to form a filtration barrier.

42. The geo-fabric assembly of Claim 41, wherein the at least one cavity comprises a plurality of pockets, each the pocket containing a portion of the flocculant material, the plurality of pockets so disposed within the geo-fabric

assembly as to minimize variations in the dispersal of the flocculant material across the geo-fabric assembly.